

AMENDMENTS TO THE DRAWINGS

The attached replacement sheet of drawings includes a change to Fig. 2. This sheet, which includes Fig. 2, replaces the replacement sheet including Fig. 2 submitted on January 30, 2008. In Fig. 2, reference character 6', added to indicate the helical wound cutting edges, has been removed.

Attachment: Replacement Sheet

REMARKS/ARGUMENTS

Entry of this amendment and reconsideration of the present application, as amended, are respectfully requested.

Claims 3-8, 10-15, 17 and 20 are presently active in this application, claims 1, 2, 9, 16, 18 and 19 having been canceled. Claim 8 is amended and the change to the claim does not relate to patentability.

New Matter/Claim Rejections 35 U.S.C. §112

The helical wound cutting edges, set forth in claims 18 and 19, are shown in Fig. 2 as originally submitted and the designation of such by the changes to the specification and Fig. 2 submitted with the amendment dated January 30, 2008 should not constitute new matter. However, to expedite prosecution of this application, proposed revised Fig. 2 is submitted herewith removing reference character 6', indicating the helical wound cutting edges on the drill part 6, claims 18 and 19 are canceled and the specification is amended to remove reference to the helical wound cutting edges. No new matter is introduced by the submission of revised Fig. 2, which is now original Fig. 2, or the change to the specification.

In view of the foregoing, it is respectfully submitted that the Examiner's objection to the amendment filed January 30, 2008 and the rejection of claims 18 and 19 under 35 U.S.C. §112, first paragraph, have been overcome and should be withdrawn.

Claim Objections

Claim 8 has been amended to include the term "wherein". No new matter has been added and no new issues are raised by the change to claim 8. Therefore, this amendment should be entered.

Claim 16 has been canceled and therefore the objection to this claim has been rendered moot.

With respect to the objection to claim 17, the features of this claim are not recited in claim 3 upon which claim 17 depends. Claim 3 recites that the pin projection includes at least one helical groove extending to the at least one groove on the drill part. Thus, this embodiment covers a construction wherein there is the same number of grooves on the pin projection and on the drill part and a different number of grooves on the pin projection than on the drill part so that there is not necessarily a one-to-one correspondence between them. On the other hand, claim 17 recites that the at least one helical groove of the pin projection extends to “a respective one of the at least one helical groove” on the drill part, i.e., if there are a plurality of helical grooves on the pin projection, each extends to a single, respective one of the grooves on the drill part. Thus, the claim 17 is narrower than claim 3.

With respect to claim 20, this claim recites that the pin projection includes a cylindrical sheath and the abrasive material is arranged on the cylindrical sheath. Claim 3 recites a cylindrical pin projection and thus differs from a cylindrical sheath.

In view of the foregoing it is respectfully submitted that the objections to claims 8, 17 and 20 have been overcome and should be withdrawn.

Claim Rejections-35 U.S.C. §103

Claims 3-8, 10, 14-17 and 20 were rejected under 35 U.S.C. §103(a) as being unpatentable over Roane (U.S. Pat. No. 5,145,373) in view of Appleby (U.S. Pat. No. 4,897,037). Claims 11-13, 18 and 19 were rejected under 35 U.S.C. §103(a) as being unpatentable over Roane in view of Appleby and Danger (U.S. Pat. No. 6,179,616). Claims 18 and 19 have been canceled and therefore the rejection of these claims has been rendered moot.

The Examiner's rejections are respectfully traversed on the grounds that the cited prior art does not disclose all of the features set forth in independent claim 3.

Claim 3 is directed to a drill 1 to extract roots of teeth and includes a shaft 2 having a head 3, a boring drill part 6 including at least one helical groove 7, a pin projection 8 arranged at a forward end of the drill part 6 and a taper 11 arranged at a transition between the drill part 6 and the pin projection 8. The pin projection 8 has a smaller diameter than the drill part 6 and an abrasive material 10 is arranged on the pin projection 8 including its tip 9. Further, the pin projection 8 including at least one helical groove 7' on the pin projection 8 extending to the at least one helical groove 7 on the drill part 6.

Thus, the pin projection 8 has a unique construction in that it has a smaller diameter than the drill part 6, includes a helical groove 7' and includes abrasive material 10, all of which are clearly seen in Fig. 2. The combination of these features provides significant advantages when using the drill 1, in that the abrasive material 10 on the pin projection 8 is able to drill material causing small particles of drilled material to form and then also removes these particles of drilled material through the helical groove 7'. The material is carried upward through the groove 7' to the helical groove 7 on the drill part 6. There is thus a synergistic effect between the presence of the abrasive material on the pin projection and the formation of the helical groove on the same pin projection.

The cited prior art does not disclose, teach or suggest a pin projection arranged at a forward end of a drill part and which includes at least one helical groove and abrasive material.

Roane discloses an endodontic drill 160 with variable diameter sections 146, 150, 154 along the length of the drill 160, and a rounded tip 170. The tip 170 does not perform any cutting function (see col. 8, lines 24-37). Graduations 156, 158 extend through the sections 146, 150,

154 and cut material upon rotation of the drill 160. There is no abrasive material on the drill 160 but rather the only material removal function is provided by the graduations 154, 156.

Appleby describes a dental bur 10 including a substrate 12 defining a shank portion 14 and an abrading portion 16. The outer surface of the abrading portion 16 includes abrasive material. There are no grooves on the dental bur 10 since the only material removal function is provided by the abrasive material.

It would not have been obvious to one having ordinary skill in the art at the time the invention was made to modify Roane in view of Appleby in order to provide a working surface with an abrading material. Neither Roane nor Appleby disclose the combined and simultaneous application of two different material removal techniques, i.e., both graduations or grooves and abrasive material, and therefore cannot teach the advantageous use of one or more grooves to enable removal of particles abraded by the abrasive material.

Roane discloses only graduations or grooves while Appleby discloses abrasive material on an ungrooved substrate. There is no teaching or suggestion in either of these references that would lead one skilled in the art to consider combining the different material removal techniques in the same drill. Moreover, one skilled in the art would consider the use of multiple material removal techniques to be unnecessary, which would refute the obviousness of the proposed modification. That is, since one skilled in the art would not consider the presence of a groove alone, without abrasive material, to be problematic and indeed, this is a widespread construction, then there would not be any reason for one skilled in the art to seek to add abrasive material. Thus, the addition of abrasive material to the drill of Roane would be deemed superfluous and clearly not obvious to one skilled in the art.

In view of the foregoing, it is respectfully submitted that it would not have been obvious to modify Roane in view of Appleby in order to arrive at the embodiment of the invention set forth in claim 3. Claims 4-8, 10-15, 17 and 18 depend from claim 3 and for the same reasons that claim 3 should be patentable over the prior art of records, these claims should also be patentable over the prior art of record. It is therefore respectfully submitted that the Examiner's rejections of claims 3-8, 10-15, 17 and 18 have been overcome and should be withdrawn.

An early and favorable action on the merits upon entry and consideration of this amendment is earnestly solicited.

FOR THE APPLICANT
Respectfully submitted,

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